Visual Displays
Magnification Functional Testi

GOAL

Visitors will discover how tuning the color of subpixels within a visu apparently continuous image.

MATERIALS

- Smartphone
- Printed image of pixel magnification
- 17.5X power magnifier
- 20-40x pocket microscope
- Subpixel color mixing device

PROCEDURE

Set-up

1. Turn on phone and display a photo preferably with both color white.
2. Make sure microscope is set to highest magnification.
3. Turn on color mixing device.

Demonstration

1. Ask visitors what they know about how the color display on a
2. Show visitors the picture on the phone. Explain that even thou continuous to our eyes, it is actually made up of tiny individu visitors the printed image of pixel magnification.
3. Place the 17.5X magnifier over the screen to show visitors the
4. Explain that each pixel is made up of three subpixels – red, g computer inside the phone precisely controls the color of thes

6. Bring out the color mixing device. Set the knobs to a relativel subpixels are visible and show visitors.

7. Allow visitors to play with the device to see if they can produ

Clean-up

1. Turn off the electronics and return all materials to storage.

EXPLANATION

Electronic display screens on smartphones, computers, and ot made up of individual elements called *pixels*. The number of pixels ir resolution of the screen; e.g. "1024 x 768" means that there are 1024 width and 768 pixels that fit along the height. Although our eyes gene image being displayed, we can see these individual pixels if we look screen. In Apple's "Retina Display" technology, the density of pixels eye cannot see the pixelation at an average viewing distance.

Within each pixel, there are three *subpixels* – red, blue, and gr how much of each color is emitted within the pixels. To our eyes, the blue, and green mix so that each pixel appears to be a different color. then make up the image that we see. The arrangement of the subpixel and the viewing angle of the screen.

Smartphone display screens are made using LCD technology LCDs do not emit light, so they have to be backlit with color filters o crystals are like twisting ladders inside the subpixels. Normally, the c and let all the light through to the color filters. When energy is added prevent light from reaching the color filters. The computer controls h each subpixel to determine what color it appears.

Group Type: Family__ School__ Other X
A: 2 #C____ Age C: M 22 F 23
M____ F____
____________ M____ F____

Evaluator: BK Date

Location in Museum:

Demonstrator:

On-site Visitor Survey – Visual Display Microscope Test

Observations

Do people appear to have difficulty using the magnifier? ____
Do people appear to have difficulty using the microscopes? ____ B
Do people ask questions to go further or just for clarification?
Going further____ Clarification____ Both____ N

Interview

1. Were you able to see the pixels with the magnifier? Yes ✓ N

2. Did you have any difficulty using the magnifier? Yes ____ N

3. Which was more helpful in learning about pixels – the printed im
   Printed image ✓ Magnifier ____

4. Were you able to see the subpixels with the 40x microscope? Ye

5. Were you able to see the subpixels with the 100x microscope? Y

6. Did you have any difficulty using either microscope? Yes ____

   BLACK IS SMALL, HA

7. On a scale of 1 to 5 (with 5 being highest), how many points wo

   4 4

8. How could we make the program better? Was anything confusin